

FORM PTO-1390 (Modified) (REV 5-93)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER	
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				048662-0130	
				U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.51) Unassigned <b>10/069786</b>	
INTERNATIONAL APPLICATION NO. PCT/DE00/02902		INTERNATIONAL FILING DATE 25 August 2000		PRIORITY DATE CLAIMED 30 August 1999	
TITLE OF INVENTION CARD-SHAPED DATA CARRIER AND METHOD FOR PRODUCING SAME					
APPLICANT(S) FOR DO/EO/US Lothar FANNASCH, Dirk FISCHER, and Michael HENNEMEYER-SCHWENKER					
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:					
1.	<input checked="" type="checkbox"/>	This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.			
2.	<input type="checkbox"/>	This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.			
3.	<input type="checkbox"/>	This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).			
4.	<input checked="" type="checkbox"/>	A proper Demand for International Preliminary Examination was made by the 19 <sup>th</sup> month from the earliest claimed priority date.			
5.	<input checked="" type="checkbox"/>	A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). <input checked="" type="checkbox"/> has been transmitted by the International Bureau. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US)			
6.	<input type="checkbox"/>	A translation of the International Application into English (35 U.S.C. 371(c)(2)).			
7.	<input checked="" type="checkbox"/>	Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). <input type="checkbox"/> have been transmitted by the International Bureau. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. <input checked="" type="checkbox"/> have not been made and will not be made.			
8.	<input type="checkbox"/>	A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).			
9.	<input type="checkbox"/>	An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).			
10.	<input type="checkbox"/>	A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).			
11.	<input type="checkbox"/>	Applicant claims small entity status under 37 CFR 1.27 .			
Items 12. to 17. below concern other document(s) or information included:					
12.	<input type="checkbox"/>	An Information Disclosure Statement under 37 CFR 1.97 and 1.98.			
13.	<input type="checkbox"/>	An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.			
14.	<input type="checkbox"/>	A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.			
15.	<input type="checkbox"/>	A substitute specification.			
16.	<input type="checkbox"/>	A change of power of attorney and/or address letter.			
17.	<input checked="" type="checkbox"/>	Other items or information: Application Data Sheet (3 pages)			

Foley & Lardner  
Customer Number: 22428

**Abstract**

22428

PATENT TRADEMARK OFFICE

SIGNATURE

NAME WILLIAM T. ELLIS

REGISTRATION NUMBER 26,874

Atty. Dkt. No. 048662-0130

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Lothar FANNASCH et al  
Title: CARD-SHAPED DATA CARRIER  
AND METHOD FOR PRODUCING  
SAME  
Appl. No.: 10/069,786  
Filing Date: 06/21/2002  
Examiner: Unassigned  
Art Unit: Unassigned

**PRELIMINARY AMENDMENT**

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to examination of the present Application, Applicants respectfully request that the above-identified prior application be amended as follows:

**In the Specification:**

Please amend the specification as follows:

On pages 2-3, delete the bridging paragraph, and replace this paragraph in accordance with 37 CFR §1.121. A marked up version showing changes is attached:

**BRIEF DESCRIPTION OF THE DRAWINGS**

Fig. 1 is a schematic diagram of a card-shaped data carrier in accordance with one embodiment of the present invention.

Fig 2 is a graph of the absorption wavelength spectrum of the layers before laser irradiation.

Fig. 3 is a schematic diagram of a triplet of colors in accordance with the present invention.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Figure 1 shows a detail from a card-shaped data carrier which has three layers (1, 2, 3), each having different absorption spectra before the laser irradiation. These three layers (1, 2, 3) are preferably located on a white substrate layer (4). In addition, above the three layers (1, 2, 3) whose absorption is to be changed under the influence of the laser radiation, there is a covering layer (5) which is transparent in the visible wavelength range and in the range of the laser radiation used.

**In the Claims:**

In accordance with 37 CFR §1.121, please substitute for original claims 1-12 the following rewritten versions of the same claims, as amended. The changes are shown explicitly in the attached "Version with Markings to Show Changes Made."

1. (Amended) A card-shaped data carrier, comprising at least one layer into which visually readable information is introduced in the form of a change in the optical property on the basis of a material change effected irreversibly by a laser beam, characterized in that the absorption capacity of this layer for at least one wavelength ( $\lambda \pm \Delta\lambda$ ) is at least partly reduced as a result of the laser radiation.

2. (Amended) A card-shaped data carrier as claimed in claim 1, wherein the layer has colored pigments which, under the influence of laser radiation with the wavelength ( $\lambda \pm \Delta\lambda$ ), at least partly lose their absorption capacity for the wavelength ( $\lambda \pm \Delta\lambda$ )

3. (Amended) The card-shaped data carrier as claimed in claim 1, comprising

- two or more layers, with each having a different absorption capacity for at least one wavelength ( $\lambda \pm \Delta\lambda$ ), and
- the absorption capacity of at least one layer for at least one wavelength ( $\lambda \pm \Delta\lambda$ ) is at least partly reduced as a result of the laser radiation.

4. (Amended) The card-shaped data carrier as claimed in claim 1, comprising
- at least two layers each of which has a respectively different absorption capacity for a different wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ,  $\lambda_2 \pm \Delta\lambda_2$ ,  $\lambda_3 \pm \Delta\lambda_3$ ),
  - the absorption capacity of a first layer for a first wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ) being at least partly reduced under the influence of the laser radiation of the first wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ), and
  - the absorption capacity of a second layer for a second wavelength ( $\lambda_2 \pm \Delta\lambda_2$ ) being at least partly reduced under the influence of the laser radiation of the second wavelength ( $\lambda_2 \pm \Delta\lambda_2$ ).
5. (Amended) The card-shaped data carrier as claimed in claim 1, wherein at least one of the layers is at least partly transparent to visible light (400 nm to 800 nm).
6. (Amended) The card-shaped data carrier as claimed in claim 1, wherein the layers whose absorption capacity is reduced under the influence of the laser radiation are arranged on a white substrate layer.
7. (Amended) The card-shaped data carrier as claimed in claim 1, wherein a covering layer that is transparent to visible light is arranged over the layers whose absorption capacity is reduced under the influence of the laser radiation.
8. (Amended) The card-shaped data carrier as claimed in claim 2, wherein the layers are plastic films laminated one over another, in which the colored pigments are contained.
9. (Amended) The card-shaped data carrier as claimed in claim 2, wherein the layers are varnish layers arranged one above another, in which the colored pigments are contained.
10. (Amended) A method for applying information to card-shaped data carriers, the card-shaped data carrier having at least one layer into which visually

readable information is introduced in the form of a change in an optical property on the basis of a material change effected irreversibly by a laser beam, comprising

- the provision of a card-shaped data carrier which has at least one layer whose absorption capacity for at least one wavelength ( $\lambda \pm \Delta\lambda$ ) is at least partly reduced as a result of the laser radiation, and
- acting on this layer of the card-shaped data carrier with the laser radiation, in order to reduce the absorption capacity of this layer for the wavelength ( $\lambda \pm \Delta\lambda$ ).

11. (Amended) The method as claimed in claim 10, wherein

- the provision of a card-shaped data carrier which has two or more layers which have a respectively different absorption capacity for at least one wavelength ( $\lambda \pm \Delta\lambda$ ), and the absorption capacity of at least one layer for at least one wavelength ( $\lambda \pm \Delta\lambda$ ) is at least partly reduced as a result of the laser radiation,
- acting on this one layer of the card-shaped data carrier with the laser radiation, in order to reduce the absorption capacity of this layer for the wavelength ( $\lambda \pm \Delta\lambda$ ).

12. (Amended) The method as claimed in claim 10 comprising

- the provision of a card-shaped data carrier which has at least a first layer and a second layer each of which has a respectively different absorption capacity for a different wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ,  $\lambda_2 \pm \Delta\lambda_2$ ,  $\lambda_3 \pm \Delta\lambda_3$ ),
- the absorption capacity of the first layer for a first wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ) being at least partly reduced under the influence of laser radiation of the first wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ),
- the absorption capacity of the second layer for a second wavelength ( $\lambda_2 \pm \Delta\lambda_2$ ) being at least partly reduced under the influence of the laser radiation of the second wavelength ( $\lambda_2 \pm \Delta\lambda_2$ ),
- acting on the first layer of the card body with laser radiation of the wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ), in order to reduce the absorption capacity of this layer for the wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ), and

- acting on the second layer of the card body with laser radiation of the second wavelength ( $\lambda_2 \pm \Delta\lambda_2$ ), in order to reduce the absorption capacity of this layer for the second wavelength ( $\lambda_2 \pm \Delta\lambda_2$ ).

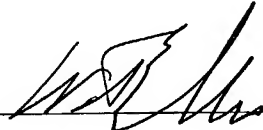
Atty. Dkt. No. 048662-0130

**REMARKS**

Applicant respectfully requests that the foregoing amendments be made prior to examinations of the present application. No new matter has been added.

Respectfully submitted,

Date 6/21/02

By 

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE****Marked up replacement paragraphs:**

Pages 2-3, bridging paragraph:

**BRIEF DESCRIPTION OF THE DRAWINGS**

Fig. 1 is a schematic diagram of a card-shaped data carrier in accordance with one embodiment of the present invention.

Fig 2 is a graph of the absorption wavelength spectrum of the layers before laser irradiation.

Fig. 3 is a schematic diagram of a triplet of colors in accordance with the present invention.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Figure 1 shows a detail from a card-shaped data carrier which has three layers (1, 2, 3), each having different absorption spectra before the laser irradiation. These three layers (1, 2, 3) are preferably located on a white substrate layer (4). In addition, above the three layers (1, 2, 3) whose absorption is to be changed under the influence of the laser radiation, there is a covering layer (5) which is transparent in the visible wavelength range and in the range of the laser radiation used.

**Marked up rewritten claims:**

1. (Amended) A card-shaped data carrier, comprising at least one layer [(1, 2, 3)] into which visually readable information is introduced in the form of a change in the optical property on the basis of a material change effected irreversibly by a laser beam, characterized in that the absorption capacity of this layer [(1, 2, 3)] for at least one wavelength ( $\lambda \pm \Delta\lambda$ ) is at least partly reduced as a result of the laser radiation.

2. (Amended) A card-shaped data carrier as claimed in claim 1, [characterized in that] wherein the layer [(1, 2, 3)] has colored pigments which, under the influence of laser radiation with the wavelength ( $\lambda \pm \Delta\lambda$ ), at least partly lose their absorption capacity for the wavelength ( $\lambda_2 \pm \Delta\lambda_2$ ).

3. (Amended) The card-shaped data carrier as claimed in claim 1 [or 2], [characterized in that] comprising

- [the same has] two or more layers [(1, 2, 3)], [which] with each [have] having a different absorption capacity for at least one wavelength ( $\lambda \pm \Delta\lambda$ ), and
- the absorption capacity of at least one layer [(1, 2, 3)] for at least one wavelength ( $\lambda \pm \Delta\lambda$ ) is at least partly reduced as a result of the laser radiation.

4. (Amended) The card-shaped data carrier as claimed in [one of the preceding claims, characterized in that] claim 1 comprising

- [the same has] at least two layers each of [(1, 2, 3)] which has [have] a respectively different absorption capacity for [at least two] a different [wavelengths] wavelength ( $\lambda_1 \pm \Delta\lambda_1, \lambda_2 \pm \Delta\lambda_2, \lambda_3 \pm \Delta\lambda_3$ ),
- the absorption capacity of a first layer [(1)] for [the] a first wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ) being at least partly reduced under the influence of the laser radiation of the first wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ), and
- the absorption capacity of a second layer [(2)] for [the] a second wavelength ( $\lambda_2 \pm \Delta\lambda_2$ ) being at least partly reduced under the influence of the laser radiation of the second wavelength ( $\lambda_2 \pm \Delta\lambda_2$ ).

5. (Amended) The card-shaped data carrier as claimed in claim 1, [one of the preceding claims, characterized in that] wherein at least one of the layers [(1, 2, 3)] is at least partly transparent to visible light (400 nm to 800 nm).

6. (Amended) The card-shaped data carrier as claimed in claim 1, [one of the preceding claims, characterized in that] wherein the layers [(1, 2, 3)] whose absorption capacity is reduced under the influence of the laser radiation are arranged on a white substrate layer [(4)].

7. (Amended) The card-shaped data carrier as claimed in claim 1, [one of the preceding claims, characterized in that] wherein a covering layer [(5)] that is transparent to visible light is arranged over the layers [(1, 2, 3)] whose absorption capacity is reduced under the influence of the laser radiation.

8. (Amended) The card-shaped data carrier as claimed in claim 2, [one of claims 2 to 7, characterized in that] wherein the layers [(1, 2, 3)] are plastic films laminated one over another, in which the colored pigments are contained.

9. (Amended) The card-shaped data carrier as claimed in claim 2, [one of claims 2 to 7, characterized in that] wherein the layers [(1, 2, 3)] are varnish layers arranged one above another, in which the colored pigments are contained.

10. (Amended) A method for applying information to card-shaped data carriers, the card-shaped data carrier having at least one layer [(1, 2, 3)] into which visually readable information is introduced in the form of a change in [the] an optical property on the basis of a material change effected irreversibly by a laser beam, [characterized by] comprising

- the provision of a card-shaped data carrier which has at least one layer [(1, 2, 3)] whose absorption capacity for at least one wavelength ( $\lambda \pm \Delta\lambda$ ) is at least partly reduced as a result of the laser radiation, and

- acting on this layer [(1, 2, 3)] of the card-shaped data carrier with the laser radiation, in order to reduce the absorption capacity of this layer for the wavelength ( $\lambda \pm \Delta\lambda$ ).

11. (Amended) The method as claimed in claim 10, [characterized by] wherein

- the provision of a card-shaped data carrier which has two or more layers [(1, 2, 3)] which have a respectively different absorption capacity for at least one wavelength ( $\lambda \pm \Delta\lambda$ ), and the absorption capacity of at least one layer [(1, 2, 3)] for at least one wavelength ( $\lambda \pm \Delta\lambda$ ) is at least partly reduced as a result of the laser radiation,

- acting on this one layer [(1, 2, 3)] of the card-shaped data carrier with the laser radiation, in order to reduce the absorption capacity of this layer for the wavelength ( $\lambda \pm \Delta\lambda$ ).

12. (Amended) The method as claimed in [either of claims] claim 10 [and 11, characterized by] comprising

- the provision of a card-shaped data carrier which has at least a first layer and a second layer [two layers (1, 2, 3) which] each of which [have] has a respectively different absorption capacity for [at least two] a different [wavelengths] wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ,  $\lambda_2 \pm \Delta\lambda_2$ ,  $\lambda_3 \pm \Delta\lambda_3$ ),
- the absorption capacity of the first layer [(1)] for [the] a first wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ) being at least partly reduced under the influence of laser radiation of the first wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ),
- the absorption capacity of the second layer [(2)] for [the] a second wavelength ( $\lambda_2 \pm \Delta\lambda_2$ ) being at least partly reduced under the influence of the laser radiation of the second wavelength ( $\lambda_2 \pm \Delta\lambda_2$ ),
- acting on the first layer [(1)] of the card body with laser radiation of the wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ), in order to reduce the absorption capacity of this layer for the wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ), and
- acting on the second layer [(1)] of the card body with laser radiation of the second wavelength ( $\lambda_2 \pm \Delta\lambda_2$ ), in order to reduce the absorption capacity of this layer for the second wavelength ( $\lambda_2 \pm \Delta\lambda_2$ ).

WO 01/15910

PCT/DE00/2902

Card-shaped data carrier and method for producing same

The invention relates to a card-shaped data carrier and to a method for producing same.

Card-shaped data carriers of this type are identity cards, bank cards, credit cards or the like made of plastic.

DE 29 07 004 C2 discloses the practice of applying visually readable information to identity cards by means of laser radiation. In this case, the information becomes visible as a result of carbonization of the plastic material, the information standing out in black or gray from a background of a different color (for example opaque or transparent). Other colors cannot be produced by this method. In this case, the laser inscription is more secure than other inscription methods with respect to forgeries or manipulations.

Furthermore, it is also known that it is possible to engrave by means of laser radiation, in particular it is possible to remove individual layers locally from a multilayer card body. Use is made of this fact in accordance with DE 30 48 733 C2, in order to apply information of different colors to identity cards. Here, a multilayer card body is used whose layers have

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different colors. As a result of the local removal of individual layers by means of laser radiation, the differently colored layer lying underneath becomes visible. This method of inscribing card-shaped data carriers has the disadvantage, however, that the surface of the data carrier is damaged by the removal.

It is an object of the invention to provide a card-shaped data carrier and a method for producing same which permits the application of colored information by means of reliable laser processing without damaging the surface of the data carrier.

This object is achieved by the characterizing features of the independent claims. In this case, the invention is based on the idea of reducing the absorption capacity of at least one layer of the data carrier for at least one wavelength (wavelength range) locally and selectively by means of laser radiation. The absorption and reflection characteristics of the layer are therefore changed locally, and therefore so is the color impression at this point.

Figure 1 shows a detail from a card-shaped data carrier which has three layers (1, 2, 3), each having different absorption spectra before the laser irradiation. These three layers (1, 2, 3) are preferably located on a white substrate layer (4). In addition, above the three

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layers (1, 2, 3) whose absorption is to be changed under the influence of the laser radiation, there is a covering layer (5) which is transparent in the visible wavelength range and in the range of the laser radiation used.

Figure 2 shows the absorption spectra of the layers (1, 2, 3) before the laser irradiation.

The absorption behavior before the laser irradiation and, respectively, the reflection behavior after the laser inscription of the individual layers is effected by appropriately color-imparting pigments, which are added to the layers as additives. Ideally, a layer is bleached out completely locally by the laser radiation, so that the layer on its own is at least virtually transparent locally (in the laser writing spot).

In the exemplary embodiment illustrated, the first laser-sensitive layer (1) has an absorption maximum in the green spectral range. Before the laser irradiation, this layer (1) has a magenta color. The second laser-sensitive layer (2) has an absorption maximum in the red spectral range. Before the laser irradiation, this layer (2) has a cyan color. The third laser-sensitive layer (3) has an absorption maximum in the blue spectral range. Before the laser irradiation, this layer (3) is yellow.

Under irradiation with a green laser beam of sufficient intensity, the first laser-sensitive layer (1) loses its absorption capacity locally where it was acted on by the green laser radiation, and therefore this layer (1) is transparent at this point. When this point is viewed under white sunlight, this point (spot) appears green, the coloration being effected on the basis of subtractive color mixing. The incident light beam (white light, for example sunlight) passes through the first layer (1) which is transparent after the application of the laser beam. As it passes through the second layer (2), the red component is filtered out of the white light beam by absorption. As it passes through the third layer (3), the blue component is filtered out of the light beam, so that from the original white light beam, only the green component remains. Finally, the green light beam is reflected at the white substrate layer (4). To the observer, this point appears green.

Under irradiation with a red laser beam of sufficient intensity, the second laser-sensitive layer (1) loses its absorption capacity locally where it was acted on by the red laser radiation, and therefore this layer (2) is transparent at this point. When this point is viewed under white sunlight, this point (spot) appears red, the coloration being effected on the basis of



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subtractive color mixing. As it passes through the first layer (1), the green component is filtered out of the white light beam. The light beam passes without absorption through the second layer (2), which is transparent at this point after the application of the laser beam. As it passes through the third layer (3), the blue component is filtered out of the light beam, so that from the original white light beam, only the red component remains. Finally, the red light beam is reflected at the white substrate layer (4). To the observer, this point appears red.

Under irradiation with a blue laser beam of sufficient intensity, the third laser-sensitive layer (3) loses its absorption capacity locally where it was acted on by the blue laser radiation, and therefore this layer (3) is transparent at this point. When this point is viewed under white sunlight, this point (spot) appears blue, the coloration being effected on the basis of subtractive color mixing. As it passes through the first layer (1), the green component is filtered out of the white light beam. As it passes through the second layer (2), the red component is filtered out by means of absorption. The light beam then passes without absorption through the third layer (3), which is transparent at this point after the application of the laser beam, so that from the original white light beam only the blue component remains. Finally, the blue

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light beam is reflected at the white substrate layer (4). To the observer, this point appears blue.

In this manner, an originally black, gray or dark brown spot can be set to be red, blue or green - depending on which of the laser-sensitive layers (1, 2, 3) in the sandwich construction is bleached.

Figure 3 illustrates the triplet of colors which may be set in this way. Of course, the application of the laser beam can also be carried out in such a way that the colored points lie one above another.

In one embodiment, the laser-sensitive layers (1, 2, 3) are plastic films, which are connected to one another by lamination. In this case, at least one laser-sensitive layer (1, 2, 3) can also be an adhesive layer between plastic films within the sandwich construction.

In an alternative embodiment, the laser-sensitive layers (1, 2, 3) are applied one after another, layer by layer, for example as varnish, to the white substrate (4) in a coating process.

As compared with a layer in which all the bleachable color pigments (magenta, cyan and yellow) are contained, the layer construction has a great advantage. This is because the colored pigments differ

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not only with regard to their absorption maximum, where they are bleached, but otherwise also, with regard to their chemical and physical properties, in particular not every pigment can be introduced to any plastic film or varnish. Furthermore, the pigments can also influence one another. If, by contrast, a dedicated layer is selected for each pigment, then the plastic film or the varnish can be coordinated specifically with this pigment.

Of course, the invention is not restricted to three laser-sensitive layers. Instead, there may also be two or four laser-sensitive layers.

Patent Claims

1. A card-shaped data carrier, comprising at least one layer (1, 2, 3) into which visually readable information is introduced in the form of a change in the optical property on the basis of a material change effected irreversibly by a laser beam, characterized in that the absorption capacity of this layer (1, 2, 3) for at least one wavelength ( $\lambda \pm \Delta\lambda$ ) is at least partly reduced as a result of the laser radiation.

2. A card-shaped data carrier as claimed in claim 1, characterized in that the layer (1, 2, 3) has colored pigments which, under the influence of laser radiation with the wavelength ( $\lambda \pm \Delta\lambda$ ), at least partly lose their absorption capacity for the wavelength ( $\lambda \pm \Delta\lambda$ ).

3. The card-shaped data carrier as claimed in claim 1 or 2, characterized in that

- the same has two or more layers (1, 2, 3), which each have a different absorption capacity for at least one wavelength ( $\lambda \pm \Delta\lambda$ ),
- the absorption capacity of at least one layer (1, 2, 3) for at least one wavelength ( $\lambda \pm \Delta\lambda$ ) is at least partly reduced as a result of the laser radiation.

4. The card-shaped data carrier as claimed in one of the preceding claims, characterized in that

- the same has at least two layers (1, 2, 3) which have a respectively different absorption capacity for at least two different wavelengths ( $\lambda_1 \pm \Delta\lambda_1$ ,  $\lambda_2 \pm \Delta\lambda_2$ ,  $\lambda_3 \pm \Delta\lambda_3$ ),
- the absorption capacity of a first layer (1) for the wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ) being at least partly reduced under the influence of the laser radiation of the wavelength ( $\lambda_1 \pm \Delta\lambda_1$ ),
- the absorption capacity of a second layer (2) for the wavelength ( $\lambda_2 \pm \Delta\lambda_2$ ) being at least partly reduced under the influence of the laser radiation of the wavelength ( $\lambda_2 \pm \Delta\lambda_2$ ).

5. The card-shaped data carrier as claimed in one of the preceding claims, characterized in that at least one of the layers (1, 2, 3) is at least partly transparent to visible light (400 nm to 800 nm).

6. The card-shaped data carrier as claimed in one of the preceding claims, characterized in that the layers (1, 2, 3) whose absorption capacity is reduced under the influence of the laser radiation are arranged on a white substrate layer (4).

7. The card-shaped data carrier as claimed in one of the preceding claims, characterized in that a covering

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layer (5) that is transparent to visible light is arranged over the layers (1, 2, 3) whose absorption capacity is reduced under the influence of the laser radiation.

8. The card-shaped data carrier as claimed in one of claims 2 to 7, characterized in that the layers (1, 2, 3) are plastic films laminated one over another, in which the colored pigments are contained.

9. The card-shaped data carrier as claimed in one of claims 2 to 7, characterized in that the layers (1, 2, 3) are varnish layers arranged one above another, in which the colored pigments are contained.

10. A method for applying information to card-shaped data carriers, the card-shaped data carrier having at least one layer (1, 2, 3) into which visually readable information is introduced in the form of a change in the optical property on the basis of a material change effected irreversibly by a laser beam, characterized by

- the provision of a card-shaped data carrier which has at least one layer (1, 2, 3) whose absorption capacity for at least one wavelength ( $\lambda \pm \Delta\lambda$ ) is at least partly reduced as a result of the laser radiation,
- acting on this layer (1, 2, 3) of the card-shaped data carrier with the laser radiation, in order to

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reduce the absorption capacity of this layer for the wavelength  $(\lambda \pm \Delta\lambda)$ .

11. The method as claimed in claim 10, characterized by
  - the provision of a card-shaped data carrier which has two or more layers (1, 2, 3) which have a respectively different absorption capacity for at least one wavelength  $(\lambda \pm \Delta\lambda)$ , and the absorption capacity of at least one layer (1, 2, 3) for at least one wavelength  $(\lambda \pm \Delta\lambda)$  is at least partly reduced as a result of the laser radiation,
  - acting on this one layer (1, 2, 3) of the card-shaped data carrier with the laser radiation, in order to reduce the absorption capacity of this layer for the wavelength  $(\lambda \pm \Delta\lambda)$ .
12. The method as claimed in either of claims 10 and 11, characterized by
  - the provision of a card-shaped data carrier which has at least two layers (1, 2, 3) which have a respectively different absorption capacity for at least two different wavelengths  $(\lambda_1 \pm \Delta\lambda_1, \lambda_2 \pm \Delta\lambda_2, \lambda_3 \pm \Delta\lambda_3)$ ,
  - the absorption capacity of the first layer (1) for the wavelength  $(\lambda_1 \pm \Delta\lambda_1)$  being at least partly reduced under the influence of laser radiation of the wavelength  $(\lambda_1 \pm \Delta\lambda_1)$ ,

- the absorption capacity of the second layer (2) for the wavelength  $(\lambda_2 \pm \Delta\lambda_2)$  being at least partly reduced under the influence of the laser radiation of the wavelength  $(\lambda_2 \pm \Delta\lambda_2)$ ,
- acting on the first layer (1) of the card body with laser radiation of the wavelength  $(\lambda_1 \pm \Delta\lambda_1)$ , in order to reduce the absorption capacity of this layer for the wavelength  $(\lambda_1 \pm \Delta\lambda_1)$ ,
- acting on the second layer (1) of the card body with laser radiation of the wavelength  $(\lambda_2 \pm \Delta\lambda_2)$ , in order to reduce the absorption capacity of this layer for the wavelength  $(\lambda_2 \pm \Delta\lambda_2)$ .



(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES  
PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

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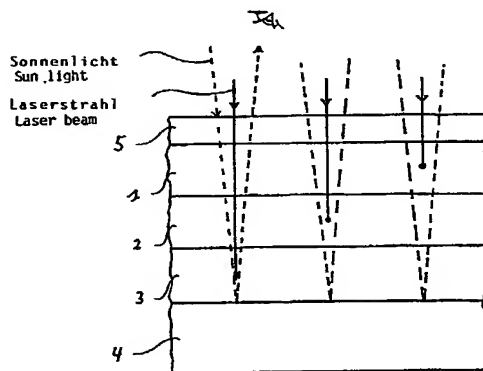
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[Fortsetzung auf der nächsten Seite]

(54) Title: **CARD-SHAPED DATA CARRIER AND METHOD FOR PRODUCING SAME**

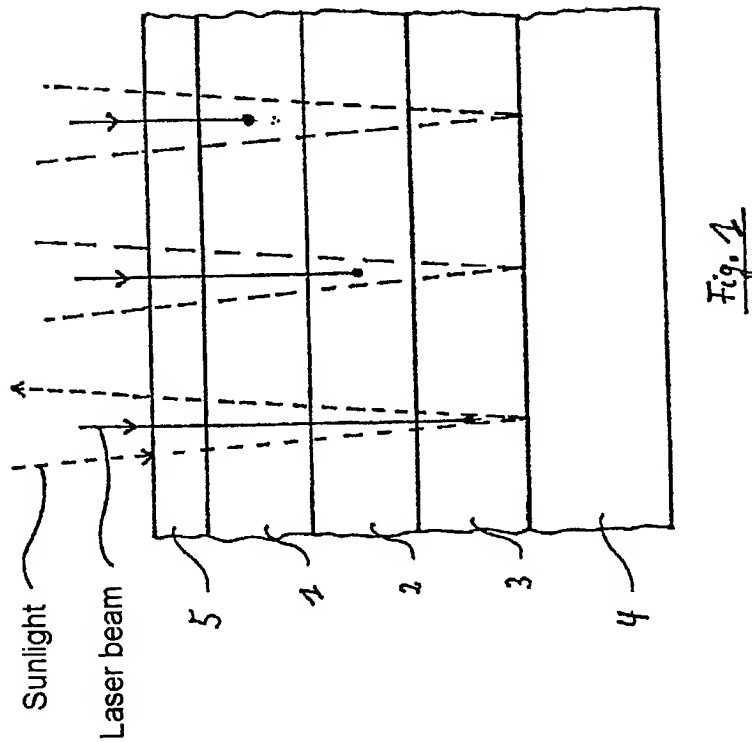
(54) Bezeichnung: **KARTENFÖRMIGER DATENTRÄGER UND VERFAHREN ZU SEINER HERSTELLUNG**



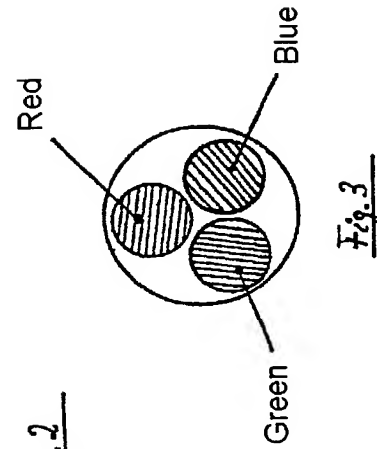
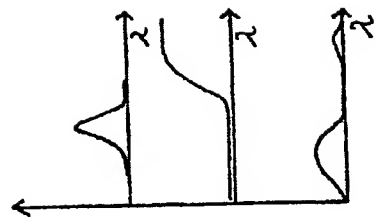
(57) Abstract: The invention relates to a card-shaped data carrier consisting of at least one layer (1, 2, 3). Visually readable information in the form of a changed optical characteristic is introduced into the layer. Said characteristic is changed by irreversibly changing the material by means of a laser beam. The absorption capacity of said layer (1, 2, 3) for at least one wavelength ( $\lambda \pm \lambda$ ) is at least partially reduced due to the laser radiation.

(57) Zusammenfassung: Kartenförmiger Datenträger, bestehend aus mindestens einer Schicht (1, 2, 3), in die visuell lesbare Informationen in Form einer Änderung der optischen Eigenschaft aufgrund einer irreversibel durch einen Laserstrahl bewirkten Materialveränderung eingebracht sind, wobei das Absorptionsvermögen dieser Schicht (1, 2, 3) für mindestens eine Wellenlänge ( $\lambda \pm \lambda$ ) infolge der Laserstrahlung zumindest teilweise reduziert wird.

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Absorption spectrum  
 before the laser irradiation



# Declaration and Power of Attorney For Patent Application

## *Erklärung Für Patentanmeldungen Mit Vollmacht*

### German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

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deren Beschreibung

(zutreffendes ankreuzen)

☐ hier beigelegt ist.

☐ am \_\_\_\_\_ unter der

Anmeldungsseriennummer

eingereicht wurde und am

abgeändert wurde  
(falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird. German Application No. 199 41 225.1 dated 30 August 1999 and German Application No. 100 11 486.5 dated 9 March 20008

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled  
"CARD-SHAPED DATA CARRIER AND METHOD FOR PRODUCING SAME" ✓

the specification of which

(check one)

☐ is attached hereto.

☒ was filed on 25 August 2000 as ✓

PCT Application Serial No. PCT/DE00/02902 ✓

(U.S. Serial No. 10/069,786) ✓

and was amended on \_\_\_\_\_

(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:  
German Application No. 199 41 225.1 dated 30 August 1999 and  
German Application No. 100 11 486.5 dated 9 March 20008

## German Language Declaration

Prior foreign applications:

Priorität beansprucht

Priority Claimed

YES(Ja) NO (Nein)

199 41 225.1 Germany 30 August 1999 ✓  
(Number) (Country) (Day/Month/Year Filed)  
(Nummer) (Land) (Tag/Monat/Jahr eingereicht)

X \_\_\_\_\_

100 11 486.5 Germany 9 March 2000 ✓  
(Number) (Country) (Day/Month/Year Filed)  
(Nummer) (Land) (Tag/Monat/Jahr eingereicht)

X \_\_\_\_\_

\_\_\_\_\_  
(Number) (Country) (Day/Month/Year Filed)  
(Nummer) (Land) (Tag/Monat/Jahr eingereicht)

\_\_\_\_\_

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 112 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.) (Filing Date)  
(Anmeldeseriennummer) (Anmeldedatum)

(Status)  
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aufgegeben)

(Status)  
(patented, pending,  
abandoned)

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aufgegeben)

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Ich erkläre hiermit, dass alle von mir in der vorliegenden Erklärung gemachten Angaben nach meinem besten Wissen und Gewissen der vollen Wahrheit entsprechen, und dass ich diese eidesstattliche Erklärung in Kenntnis dessen abgebe, dass wissentlich und vorsätzlich falsche Angaben gemäss Paragraph 1001, Absatz 18 der Zivilprozessordnung der Vereinigten Staaten von Amerika mit Geldstrafe belegt und/oder Gefängnis bestraft werden koennen, und dass derartig wissentlich und vorsätzlich falsche Angaben die Gültigkeit der vorliegenden Patentanmeldung oder eines darauf erteilten Patentes gefährden können.

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## German Language Declaration

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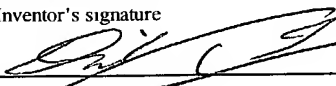
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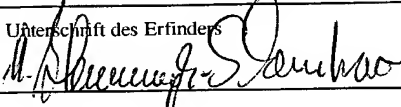
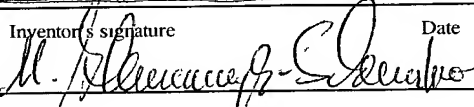
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